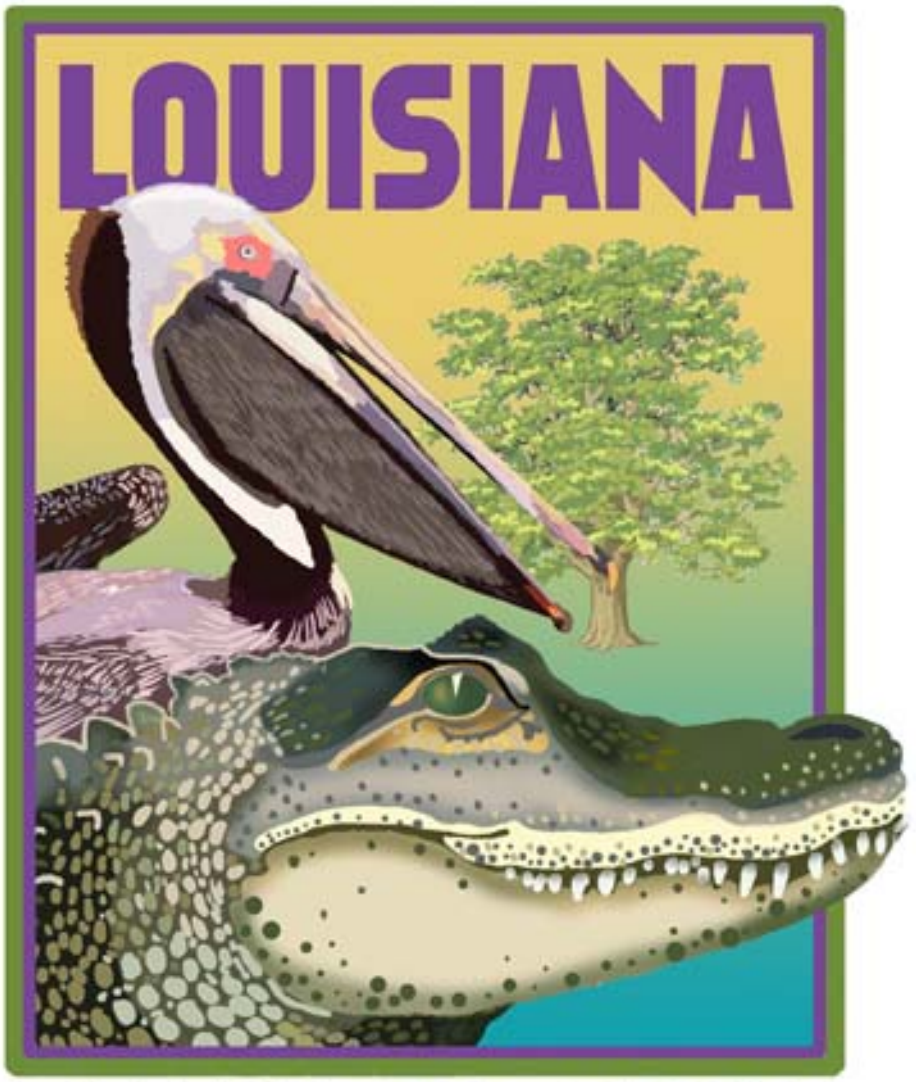

ENVIROTHON

2004 Advisors Handbook

The Louisiana Envirothon is made possible by the cooperative efforts of the following organizations:

Sponsored by

Governor's Office of Environmental Education
Louisiana Environmental Education Commission

In Cooperation with

Louisiana Department of Agriculture and Forestry
Louisiana Department of Environmental Quality
Louisiana Department of Wildlife and Fisheries
LSU AgCenter Cooperative Extension Service
Natural Resources Conservation Service
Resource Conservation and Development Councils
University of Louisiana at Lafayette

With Support from

Canon Envirothon
Louisiana Association of Conservation Districts
Louisiana Department of Environmental Quality
Louisiana Environmental Education Commission
Louisiana Environmental Educators Association
Louisiana Forestry Association
Louisiana Logging Council
United States Forest Service

Table of Contents

Introduction

Envirothon Philosophy

The goal of environmental education is the development of knowledgeable, skilled and dedicated citizens who are willing to work toward achieving and maintaining a natural balance between quality of life and the quality of the environment. The Louisiana Environmental Education Commission and the Governor's Office of Environmental Education are promoting environmental education through the Louisiana Envirothon. The Louisiana Envirothon works in partnership with resource management professionals and the general public to promote and strengthen the goal of environmental education.

What Is The Envirothon?

The Louisiana Envirothon is a multidisciplinary, environmental problem-solving competition for students in grades 9 through 12. Teams may be comprised of students at the same school, or can be associated with an organized group (i.e. FFA, 4-H, home-school groups, etc.). Participating teams (five students plus one alternate) train and compete in five natural resource areas: soils/land use, aquatic ecology, forestry, wildlife, and a current environmental issue. The current environmental issue for 2004 is Natural Resource Management in the Urban Environment. There is also an oral presentation component of the competition, in which teams present a solution to an environmental problem related to the current issue. Throughout the competition students learn in a real-life context the complexities of solving environmental problems while working as a team and having fun.

The Louisiana Envirothon

The first Louisiana Envirothon will be held at the Model Sustainable Agriculture Center (MSAC) of the University of Louisiana at Lafayette on June 8 – 9, 2004. The MSAC is located at the Cade Farm facility on 1234 W. J. Bernard Road in St. Martinville, Louisiana. The winning state team will travel to the Canon Envirothon competition this summer to represent Louisiana. The Environmental Education Commission will pay all of the team's expenses to the Canon Envirothon Competition held July 26 – August 1, 2004 at Wesleyan College in Buckhannon, West Virginia. Each member of the first place winning team of the Canon Envirothon will receive a $3,000 scholarship. The second place team members each receive a $2,000 scholarship and the third place team members each receive a $1,000 scholarship. The winning team members, along with their teacher-advisor, receive a variety of Canon products.

Advisors

Volunteer Advisors are responsible for directing local Envirothon groups/teams. His or her duties include promoting the Envirothon program, recruiting students to participate, and arranging/providing the learning activities, curricula, and anything else necessary to prepare his/her group for competition.

Many **resources** are available to assist an advisor with his/her responsibilities and can be obtained from the State Envirothon Committee.

Goals and Objectives

Goal 1:

To promote a desire to learn more about the natural environment and equip students with the knowledge and skills needed to apply the basic principles and practices of resource management and ecology to complex environmental issues.

a. Students should be able to demonstrate a basic knowledge of concepts in natural resource management and ecology, especially in the areas of soils/land use, aquatic ecology, forestry, wildlife, and current environmental issues.

b. Students should be able to analyze soil, aquatic, forestry, wildlife, and current environmental issues in problem-solving activities involving resource issues.

Goal 2:

To promote stewardship of natural resources and to encourage the development of the critical thinking, cooperative problem-solving, and decision-making skills required to achieve and maintain a natural balance between the quality of life and the quality of the environment**.***

a. Students should be able to identify environmental issues in a given situation and the various interests involved, while taking into consideration ecological, social, and economic factors.

b. Students should be able to investigate issues using both primary and secondary sources of information and synthesize the data gathered. Additionally, students should demonstrate the ability to:

- Listen with comprehension;
- Collect, organize, and analyze information;
- Frame appropriate questions to guide their investigation;
- Use a range of resources and technologies in addressing questions; and
- Critically examine information from a variety of sources.

c. Students should be able to assess the nature of information and materials from a variety of different viewpoints and evaluate their implications.

d. Students should be able to identify alternative solutions for various issues and their associated value perspectives. They should be able evaluate alternative solutions with respect to their ecological and cultural implications. Additionally, the alternative solutions generated should attempt to take into consideration the variety of interests involved, while maintaining a healthy environment.

e. Students should be able to identify and evaluate their own position on environmental issues and their associated solutions. These positions should be based on balanced information, critical analysis, and careful synthesis. Moreover, students should be able to test their position against new information, personal experiences and beliefs.

f. Students should be able to evaluate the interaction of the proposed solution with other ecological and social factors and anticipate having to plan ahead when evaluating the long and short-term implications of possible solutions to environmental problems.

Goal 3:

To provide students with experience in environmentally-oriented activities, enabling them to become environmentally-aware, action-oriented citizens.*****

a. Students should have knowledge of a wide range of action strategies involved in seeking solutions to environmental problems.

b. Students should have a knowledge of agencies and organizations that can be used as resources to seek solutions to environmental problems.

c. Students should be able to evaluate the impact of their own actions affecting a particular environmental problem and devise alternative actions to work towards improving environmental conditions.

d. Students should be able to work independently and/or collaboratively to solve environmental problems.

*Adapted from the draft National Standards for Environmental Education (NAAEE), August 1995 draft.

The Envirothon Competition

Overview

Students, competing as team members, rotate through a series of five stations that are managed by natural resource specialists. For example, a forester may conduct the forestry station, and a soil scientist can be expected to coordinate the activities at the soils/land use station. At each of the five stations, team members will be given a written test (which involves hands-on field activities) to complete. Each test is taken as a team with each team member participating in answering the questions. Test questions may be asked in a variety of ways. For example, test questions may be, but are not limited to multiple choice, true/false, essay or fill-in-the-blank. Sample tests are available on the Canon Envirothon website at www.envirothon.org/sitemap.

Each team will also be presented with an environmental problem that is based on the "current environmental issue." The hypothetical environmental problem situation (and presentation materials) will be given to each team the night before the competition. Each team will be asked to develop and present a management plan for the hypothetical problem. All five members of the team must verbally participate in the oral presentation.

After combining scores from the written tests and the oral presentation, the top three teams will be recognized and receive awards. A monetary Teacher Award will also be presented to the coach/advisor of the state winning team.

The top scoring team at the state competition will go on to represent Louisiana at the Canon Envirothon, which will be held July 26 – August 1, 2004 at Wesleyan College in Buckhannon, West Virginia.

Competition Scoring

1. There will be a high score winner in each of the following areas of the competition: Aquatic Ecology, Forestry, Soils/Land Use, Wildlife, Current Issue and Oral Presentation.

2. The winner of each testing station — Aquatics, Forestry, Soils, Wildlife and Current Issue, will be the team with the highest test score (100 points possible). The Oral Presentation is judged by a panel of experts. The Oral Presentation score will be the average of all the judges' scores (200 points each).

3. There will be one overall winner. The overall winner is determined by the cumulative total (700 points possible) of the five station test scores (100 points each) plus the final oral presentation score (200 points). This team will be eligible to represent Louisiana at the Canon Envirothon.

4. If needed, the tiebreaker shall be in the order as follows: Oral Presentation Score, Current Issue score, Aquatic Ecology score, Forestry score, Soils/Land Use score, Wildlife score.

Rules and Regulations

The Louisiana Envirothon shall be conducted under the following rules and regulations:

1. Only students enrolled in grades 9 through 12 or equivalent home school ranking in the previous school year are eligible to compete in the Louisiana Envirothon.
2. A school may send multiple teams to the Louisiana Envirothon, and each team will compete independently.
3. Each team must consist of five students from the same school and/or organization throughout the competition to be eligible for placement in the competition. All five students must participate in the oral presentation. Only the five team members will be allowed at the testing stations. Each team may have an additional student on the team to serve as an alternate.
4. Teams must be accompanied by an adult Advisor. Advisors are required to stay on-site and will be responsible to assure that the team members display proper conduct during the competition and at the host facility.
5. Each team should arrange for an adult male to chaperone male team members and an adult female to chaperone female team members for teams staying overnight.
6. There will be no access given to the testing stations for team Advisors or students before the competition or during lunch.
7. No advisor, sponsor, teacher, alternate, or parent may communicate with team members once the competition begins. Violation of this rule will cause disqualification of the team(s).
8. During testing, breaks, and lunch, the advisors may not rotate or join their respective teams. No contact between advisors and their team(s) shall be made until after all testing and oral presentations are completed. Each team will be assigned an adult team buddy who will accompany them throughout the competition. Adult team buddies are responsible for student compliance to the above rules. Advisors will be assigned to a group consisting of other schools' teams if they wish to rotate among testing stations during the competition.
9. Teams from the same school are not permitted contact until after testing is completed, including the lunch hour. Adult team buddies are responsible for student compliance to this rule.
10. Team members may be substituted by submitting written notification to the Office of Environmental Education prior to May 3, 2004.
11. Snuff, tobacco, illegal drugs, and alcohol are not permitted during any part of the competition. Noncompliance with this rule will be grounds for disqualification.
12. Cooperating environmental agencies and independent environmental organization personnel will conduct the competition.
13. Judges' decisions are final on all events.
14. Only keys, reference materials, and equipment provided by the Louisiana Envirothon Committee will be allowed for use at the event. No electronic, battery-operated or solar-powered equipment may be used by teams during any portion of the competition.
15. No backpacks will be allowed on the testing circuit.
16. The rules and regulations of the Louisiana Envirothon are subject to change. All changes to the Envirothon rules will go into effect on September 1 and will be in effect until August 31 of the following year.
17. Envirothon Competition fees are fully refundable prior to April 2, 2004. One half of fees are refundable prior to May 3, 2004.

Oral Presentation Rules

1. Oral presentations will be 10-15 minutes in duration, and may not exceed 15 minutes.
2. Each team member must have an equal part in the presentation.
3. There will be a 3 minute question period by judges.
4. The use of visual aids during the oral presentation is limited to those visual aids that can be constructed by students during the allocated preparation time the night before the competition. When constructing visual aids students may only use those materials provided by the Envirothon Committee.
5. All presentation materials will be collected from the student teams after the oral presentation preparation time provided the night before.

Current Environmental Issue

Natural Resource Management in the Urban Environment

The U.S. population has grown increasingly urban each decade, from 28 percent in 1910 to 80 percent in 2000 (US Census Bureau, Demographic Trends in the 20th Century). Currently, the majority of us live and/or work in cities and towns that are part of complex urban ecosystems. Like other ecosystems, urban ecosystems are communities of organisms and environmental features functioning as ecological units.

The natural resources of urban ecosystems have a multitude of social, environmental, and economic values and benefits such as providing habitat for plants and animals that could otherwise be absent from urban areas; increasing aesthetic appeal, which can boost property values and improve personal contentment; improving air and water quality; reducing noise and lowering energy consumption for heating and cooling; and providing open space for outdoor recreation.

However, there are numerous factors which impact the health and function of these urban ecosystems, which in turn result in social, environmental, and economic issues and problems. "For example, in urban areas summer temperatures and noise levels are higher than in the surrounding countryside, air and water pollution problems are more concentrated, and the landscape is significantly altered." (Urban and Community Forestry: Improving Our Quality of Life). And many people do not understand how vital it is to manage urban natural resources in a manner that encourages wise use and conservation.

By studying urban forests, soils, water, and wildlife for the 2004 Louisiana Envirothon, students will

1. Gain awareness of the social, environmental, and economic values and benefits of urban natural resources,
2. Investigate the issues surrounding the utilization, management, and protection of these resources, and
3. Develop an understanding of how properly managed urban natural resources can provide an attractive and healthy green infrastructure for our communities.

Learning Objectives

Aquatic Ecology

Students should be able to:

1. Describe the processes of the hydrologic cycle including transpiration and aquifer recharge.
2. Describe water in its three states of matter, the structure of the water molecule and relate it to water's ability to dissolve substances, cohesion and capillary action.
3. Discuss what causes nitrate contamination of well water; where in the U.S. you would most likely find it, what can happen if you drink nitrate contaminated water and what can be done to reduce it. Understand basic well construction and the importance of well grouting. Know what wellhead protection is and what constitutes a wellhead protection program.
4. Discuss what ground water and the processes that cause it to become stored and replenished mean. Understand recharge and how it occurs. Learn the processes of ground water contamination and what can be done to clean contaminated ground water. Discuss how an on-site waste disposal system works.
5. Explain how drinking water is monitored using the Safe Water Drinking Act. Be able to discuss the importance of the Clean Water Act.
6. Discuss coliform bacteria and explain why they are used as indicator organisms in drinking water.
7. Know what water conservation is and steps that can be taken at both the individual and government levels. Understand some of the basics of water resource management.
8. Discuss what causes lead contamination in drinking water and what can be done to decrease it.
9. Understand what is meant by non point source pollution and be able to give some examples, including plant nutrients, sediment and toxic chemicals.
10. Explain some basic water quality parameters such as pH and toxic chemicals. Be able to identify the equipment used by scientists who monitor water. Know how to use a pH meter, a thermometer and a dissolved oxygen meter.
11. Describe a wetland. Discuss why wetlands are important and what steps might be taken to preserve them. Know the difference between several types of wetlands such as marshes and estuaries.
12. Describe a simple aquatic food web, including producers and consumers, herbivores, omnivores, carnivores and detritivores.
13. Describe a watershed. How could you use a topographic map to outline a watershed?
14. Describe and identify simple aquatic insects, especially those which can be used to indicate clean or polluted water.
15. Explain the water treatment processes used to produce clean drinking water or to treat sewage.

Forestry

Students should be able to:

1. Identify common trees without a key.
2. Understand the uses of different trees for pulp, lumber, wildlife, etc.
3. Identify specific or unusual species of trees or shrubs through the use of a key.
4. Understand tree anatomy and physiology.
5. Understand how wildlife habitat relates to: forest communities, forest species, forest age structure, snags and den trees, availability of food and cover and riparian zones.
6. Understand basic forest management techniques and the purpose for their use-harvesting regulations, intermediate cutting and TSI (timber stand improvements) protection.
7. Be familiar with the use of a Biltmore Stick and other forestry tools.
8. Understand the value of trees in urban/suburban/rural settings and the factors affecting their health and survival.
9. Understand the multiple use concept in the management of forests.
10. Be familiar with forest history, forest inventory and what is meant by sustainable forestry.

Soils/Land Use

Students should be able to:

1. Know the characteristics of soil horizons and the features of a soil profile.
2. Identify and understand soil properties (including color, texture, structure, porosity, etc.) and their relation to soil characteristics, uses and limitations.
3. Know the characteristics of soil constituents (clays, organic matter, sand and silt).
4. Understand soil drainage classes and know how wetlands are defined.
5. Know how to use and understand a soil survey.
6. Know how soil can be used as a filter for pollutants.
7. Be aware of the effects of land uses on soils.
8. Identify the factors affecting soil erosion by wind and water.
9. Understand the origin of soil parent materials and be familiar with glacial geology.
10. Understand the nature of plant nutrients and how they are held by soil material.
11. Understanding of soil water, its movement, storage and uptake by plants.
12. Know how to measure soil slope.

Wildlife

Students should be able to:

1. Identify common wildlife species (game animals, furbearers, endangered species, etc.) and be able to identify biofacts (hair, fur, feathers, gnaw marks, etc.) wildlife signs. Keys will be used for more extensive identification.
2. Identify basic wildlife habitat and survival needs (food, water, shelter/cover, space).
3. Describe specific adaptations of wildlife to their environment and their role in the ecosystem.
4. Describe predator - prey relationships and give examples.
5. Describe food chains and food webs and cite examples.
6. Evaluate a given habitat for its suitability for a designated species, given a description of the habitat needs of the species.
7. Describe ways that habitat can be improved for specific species by knowing their habitat requirements.
8. Describe factors that limit or enhance population growth. Discuss the concept of carrying capacity and limiting factors.
9. Discuss various ways the public and wildlife managers can help in the protection, conservation, management and enhancement of wildlife populations.
10. Describe the potential impact of the introduction of non-native species.
11. Describe major factors affecting threatened and endangered species and methods used to improve the populations of these species.
12. Identify species from given natural history information.
13. Understand the roles of wildlife in an ecosystem.
14. Understand some key wildlife laws and the reasons behind many DNR regulations. (i.e. regulations designed to protect the resource and spread it out among would-be users).
15. Understand some of the basic "tools" of wildlife managers (hunting, habitat manipulation, population census techniques, people management, etc.)

2004 Current Environmental Issue

Natural Resource Management in Urban Environments

- Compare and contrast urban ecosystems to non-urban ecosystems.
- Identify and describe the similarities and differences that exist between urban and non-urban ecosystems.

Soils/Land Use — Soil conditions greatly influence the growth and vigor of vegetation, the stability of structures, the drainage of storm water, and water quality in urban areas.

- Understand the common problems found in urban soils and suggest techniques to prevent or correct them.
- Discuss the soil characteristics necessary for vegetation growth and examine specific soil conditions found in urban areas.
- Explain how soil properties in urban areas affect the stability of structures and water quality.

Aquatic Ecology — Water resources in urban environments are vital to community sustainability.

- Describe the primary functions of urban watersheds.
- Discuss best management practices to control or prevent contamination of water resources in urban environments.
- Describe tools, resources, and actions used to protect urban drinking water supplies.
- Describe how residents can use water wisely.

Forestry — Urban forests provide important functions that are impacted by development.

- Explain the term urban forestry and understand typical urban forestry programs.
- Understand the social, environmental, and economic values and benefits of urban forests.
- Explain the major issues impacting urban forests and describe management options to maintain or improve the health and function of urban forests.

Wildlife — Urban environments have an impact on wildlife diversity, health, and behavior.

- Define urban wildlife and describe its needs.
- Describe ways various species have acclimated to living in an urban area and the characteristics of urban wildlife habitats.
- Explain management options for encouraging or discouraging urban wildlife.

State Competition Preparation Checklist

Maintain close contact with the Governor's Office of Environmental Education prior to the competition. Ensure the following checklist is completed:

- ❑ Your team is registered and the registration fee has been paid.
- ❑ Transportation has been arranged to the competition location.
- ❑ Lodging (if necessary) has been arranged.
- ❑ Team members are familiar with the rules of the competition.
- ❑ Team members are trained in each of the five test areas: soils, aquatic resources, forestry, wildlife and the current environmental issue.

Resources

Sample Test Questions

Sample tests are available on the Cannon Envirothon website at www.envirothon.org/sitemap.

Oral Presentation Judges' Scoring Sheets

The Louisiana Envirothon will use the Canon Envirothon Judges' Scoring sheets for its state Envirothon competition. The Cannon Envirothon Judges' Scoring sheets are available at the Cannon Envirothon website at www.envirothon.org/sitemap.

Resource Organizations

Publications and reference materials for all disciplines can be obtained from local, state, and federal agencies listed below.

Environmental Protection Agency	http://www.epa.gov/
Farm Service Agency	http://www.fsa.usda.gov/
Geological Survey	http://www.usgs.gov/
National Park Service	http://www.nps.gov/
Nature Conservancy	http://www.nature.org/
USDA Forest Service	http://www.fs.fed.us/
USDA Natural Resources Conservation Service (NRCS)	http://www.nrcs.usda.gov/
U.S. Fish and Wildlife Service	http://www.fws.gov/
World Wildlife Fund	http://www.wwf.org/

Soil Links

http://www.sciencedaily.com/directory/Science/Agriculture/Soils

http://soils.usda.gov/sqi/soil_quality/soil_biology/index.html

http://soils.usda.gov/sqi/

http://www.sarep.ucdavis.edu/soil/websites.htm

http://www.cwp.org Center for watershed protection - lots of related info and links

http://www.ctic.purdue.edu Conservation technology and information center

http://www.epa.gov/region6/water/npdes/sw/ms4/index.htm (see "Storm Water HotTopics)

http://www.iwla.org Isaac Walton League - great aquatics info

http://www.nacdnet.org National Association of Conservation Districts - relevant links and other useful info

http://www.la.nrcs.usda.gov USDA Natural Resources Conservation Service - soils and related educational info

http://www.projectwet.org Project WET (Water Education for Teachers) water ed info and links

http://www.agry.purdue.edu/courses/agry255/brochure/brochure.html Soils info

http://www.swcs.org/f_orglinks_links.htm Natural resource educational info

http://www.usgs.gov/education U.S. Geological Survey - Natural resource educational links and info

http://wwwga.usgs.gov/edu/ Water related info

http://cfpub.epa.gov/npdes/stormwater/menuofbmps/bmp_files.cfm Urban and residential storm water management info

http://www.cyber-sierra.com/area9/p-soils.html Soils Info

http://www.attra.org/soils.html Soils info

http://www.forestsoils.org/S-7/ Soils info

http://www.des.ucdavis.edu/iad217/soilsites.html Soils Info

http://iaswww.com/ODP/Science/Agriculture/Soils Soils Info

http://www.jsasd.k12.pa.us/mhopple/nature/soils.htm (past) Pennsylvania Envirothon

Wildlife References

Owen, Oliver S. and Daniel D Chiras. Natural Resource Conservation: Management for a sustainable future. Chapters 1, 2, 3, 10, 11, 14 & 15.

Lowery, George. The Mammals of Louisiana and its Adjacent Waters.

Lowery, George. Louisiana Birds.

Manooch, Charles S and Duane Raver. Fisherman's Guide to the Fishes of the Southeastern United States.

Dundee, Harold A. and Douglas Rossman. The Amphibians and Reptiles of Louisiana.

Louisiana Recreational Fishing Regulations 2003

Louisiana Hunting Seasons and Wildlife Management Area Regulations 2003-2004.

Louisiana Hunter Education Manual, Chapters 1 and 2.

Boy Scouts of America Merit Badge book: Fish and Wildlife Management